

# Work Order ID 77628

December 14, 2011 9:06:50 AM

**\*77628\***

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Item ID: D6104-003 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
 Item Name: Round Billet, 17-4  
 Start Date: 12/14/11 Start Qty: 16.00 **\*16\*** Cust Item ID:  
 Required Date: 12/29/11 Req'd Qty: 16.00 **\*16\*** Customer:  
 Reference:

Approvals: Process Plan: CL Date: 11/12/14 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D6104	Rev B								

100 PURCHASING 0.00  
**\*100\***  
 Purchasing Memo 0.00  
 Purchasing Issue P/O: 15675 a)Description: S.S round billet b) Ø3.25" x 3.80" long c) Tolerance on all dimensions are +0.030"/-0.000" d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630) e) One blank makes 2 parts f) Material certification required

CL 11/12/14 (16)

110 Receive & Inspect for Damage & Mat'l Certs 0.00  
**\*110\***  
 Packaging Memo 0.00  
 Packaging Ensure material certification is attached

12/14/11 (16)

120 QC6- Inspect dimensions to drawing 0.00  
**\*120\***  
 QC Memo 0.00  
 Quality Control Ensure Material certification comply to Dwg D6104

12/10/11 16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Work Order ID 77628

**\*77628\***

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Item ID: D6104-003 Accept **\*N900040100\*** Setup Start **\*NS1\***  
 Revision ID: Stop **\*NS2\***  
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 Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_ Run Start **\*NR1\***  
 QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_ Stop **\*NR2\***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Identify as per dwg & Stock Location: <i>MAT 47</i>	0.00							
<b>*130*</b>									
Packaging	Memo	0.00							
Packaging									
140	QC21- Final Inspection - Work Order Release	0.00							
<b>*140*</b>									
QC	Memo	0.00							
Quality Control									

*12/11/09*  
*ME*  
*12-01-09*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

December 14, 2011 9:06:49 AM

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Work Order ID: 77628

Parent Item: D6104-003

Start Date: 12/14/11

Required Date: 12/29/11

Parent Item Name: Round Billet, 17-4

Start Qty: 16.00

Required Qty: 16.00

Comments: IPP B: 01.09.04Revised Step 2 SM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-003P 17-4 SS Roundbar 3.25"OD		Purchased	No			110	Each	0.0000	1	16		12/14/11	(16)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

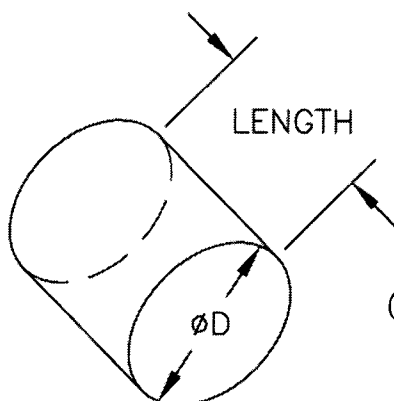


DESIGN <i>RT</i>	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4 SCALE NTS	
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

## SPECIFICATION CONTROL DRAWING



*CD 11/12/14  
W10:77628*

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO15675

Purchase Order Date 12/14/11

PO Print Date 12/14/11

Page Number 1 of 1

Order From :

VC-MET001

METAUX CASTLE  
A.M. CASTLE & CO. (CANADA) INC. - BOX B9204 PO BOX 9100  
TORONTO, ON M4Y 3A5  
CA

Contact Name		Buyer	Chantal Lavoie
Vendor Phone	514 694 9575	Requisition Nbr	
Vendor Fax	514 695 3281	Tax Resale Nbr	10127-2607
Vendor Account Nbr		Terms	Net 30
		Currency	CAD
		FOB	Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

*CL 12/14/11*  
*e-mco*

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	D6104-003P	17-4 SS Roundbar 3.25"OD	1/04/12 Yes	16.00 Each	Yours ppd	\$44.0000	\$704.00

Special Inst: AS PER DWG D D6104 REV. B  
B77628  
MATERIAL: 17-4 PH AS PER AMS 5643  
OR AISI 630  
SIZE: 3.25" X 3.80" LONG

PO Total: \$704.00

MATERIAL CERTIFICATION  
REQ'D UPON DELIVERY

Change Nbr: 1

Change Date: 12/14/11

*CL*  
No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required when applicable



**Castle Metals®**

A. M. Castle &amp; Co.

## PACKING SLIP

Page 1 of 1

Shipment No:1124793

<b>Ship From:</b>		<b>Sold To:</b>		<b>Ship To:</b>		<b>Deliver To:</b>	
A. M. Castle & Co. (Canada) Inc. MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA		DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CAN		DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
<b>Date Shipped</b>	<b>F.O.B.</b>	<b>Freight Terms</b>		<b>Carrier</b>		<b>BOL No</b>	
04-JAN-2012	ORIGIN	Prepaid		MANITOULIN		1124793-2	

<b>Shipment Details</b>	<b>Final Destination Branch - MON</b>
-------------------------	---------------------------------------

Order No 1889872	Line No 1	Item No 42470.MO	Description 3.2500.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 3.8 IN (+ .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643				
Purchase Order No 15675		Part Number YOUR ITEM NUMBER: D6104-003		Ordered Qty 16.00 PCS		Invoice Qty 16.00 PCS	
Details							
Delivery No. 110481331	Mill NORTH AMERICAN STAINLESS	Heat Number 9JR3	Mech Id	PCS 16	Width (IN)	Length (IN)	Shipped Qty(LBS) 142.93

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:

Name:



**NORTH AMERICAN  
STAINLESS**

## METALLURGICAL TEST REPORT

6870 Highway 42 East  
Ghent, KY 41045-9615  
(502) 347-6000

Certificate: 651437 05    Mail To:  
A.M. CASTLE AND COMPANY  
3400 NORTH WOLF ROAD  
FRANKLIN PARK    IL 60131  
Customer: 0032 005  
NAS Order: LN 72407    1  
Your Order: 106973

Ship To:  
A.M. CASTLE AND COMPANY  
26800 MILES ROAD  
BEDFORD HEIGHTS    OH 44146

Date: 6/21/2011    Page: 1 Of 1  
Steel: 630(17-4)  
Finish: Hot Finish  
Dia/Thk: 3.2500 in  
Leg Length:  
Length: 144.00 in  
Corrosion:

Item Code: 42470

### PRODUCT DESCRIPTION:

AMS 2303E, AMS 5643R  
Round Bar, Hot Rolled, Annealed, Rough Turned  
UNS S17400; EN 10204 3.1B, ASTM A484/08  
ASTM A564/10 ASME SA564-07

### REMARKS:

COMPLIES W/REQUIREMENTS OF DFARS EU DIRECTIVE 2002.95.  
EC. RoHS. EAF+AOD+CC. NO WELD REPAIR. MELTED AND MFG IN USA  
FREE FROM MERCURY AND LOW MELTING ALLOY CONTAMINATION

Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight	Bundle Weight
BD90286    1844	BD90288    1838	BD90300    1472							

### CHEMICAL ANALYSIS    CM(Country of Melt)    ES(Spain)    US(United States)    ZA(South Africa)    JP(Japan)

Heat	Supplier #	CM	C	CB	CO	CR	CU	MN	MO	N	NI	P
9JR3		US	.035	.242	.08	15.25	3.13	.51	.17	.032	4.36	.030
			S	SI	TA	TI						
			.0078	.57	.0055	.0050						

### MECHANICAL PROPERTIES

	l d o i c r	HB No.	Ferr %	TS-C KSI	YS-C KSI	El-C %	RA-C %	RC-C No.
BD90286	R L	324.0	.60	195.85	174.89	10.08	47.28	43.0
BD90288	R L	324.0	.60	195.85	174.89	10.08	47.28	43.0
BD90300	R L	324.0	.60	195.85	174.89	10.08	47.28	43.0

NAS hereby certifies that the analysis on this certification is correct and the material meets the specifications stated.

QC ENGINEER

ERIC HESS